Submission No 48

INQUIRY INTO INQUIRY INTO PFAS CONTAMINATION IN WATERWAYS AND DRINKING WATER SUPPLIES THROUGHOUT NEW SOUTH WALES

Organisation: SORR

Date Received: 18 December 2024

Dear Jess,

Thank you for your email and for offering the opportunity to make a late submission to the NSW PFAS Parliamentary Inquiry. I kindly request that this be forwarded to the committee for their consideration.

As the General Manager of SORR, I'm pleased to provide insights into our *Gyroid Sponge Technology* and its advanced capabilities in addressing PFAS contamination. This technology offers a comprehensive approach across three key areas: **diagnostics, prevention, and remediation.**

Expanded Submission to the NSW PFAS Parliamentary Enquiry (to be forwarded with previous email)

1. PFAS Findings in Tuggerah Lake (LJ19 Site)

During our *Community Science Trial* on *Tuggerah Lake*, we deployed the Gyroid Sponge technology at the LJ19 location, where it captured **2.94 grams of PFAS per kilogram of sponge**. This deployment highlighted both the extent of contamination and the sponge's capability to act as an efficient passive sampling tool for PFAS.

LJ19 was identified as a contamination hotspot influenced by both **industrial discharge** and **stormwater inflows** from the surrounding catchment. These findings align with broader concerns around PFAS accumulation in Central Coast waterways and its impact on local ecosystems.

Results - PFAS Sponge Analysis

The second sample of sponge sent to Microanlysis was tested for PFAS by weight and resulted in 2.93gr of PFAS retained per KG of sponge.

Once again SORR will refrain from interpreting these results however continue to acknowledge that in any quantity these chemicals can be considered to be an issue for the environment due to there cumulative effect.

Table 2: Identified class of compound per kg of sponge.

Class	Class/sponge (g/kg)
Hydrocarbon	144.28
PFAS	2.93

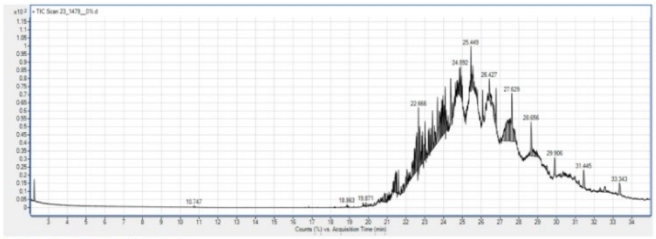

Figure 1: Total Ion Chromatogram for the sample.

2. Positive Results from Socotec UK Lab

Following the LJ19 deployment, the Gyroid Sponge samples were sent to *Socotec UK*, a globally recognised laboratory, for independent analysis. The results confirmed the Gyroid Sponge's exceptional performance in capturing and retaining PFAS contaminants, demonstrating:

- **High Adsorption Efficiency:** The sponge effectively captured multiple PFAS compounds, including **PFOA, PFOS, and other short-chain variants**.
- **Consistency Across Environments:** Results aligned with prior international deployments, validating the sponge's robustness under variable field conditions.

To illustrate, the graph below highlights the PFAS concentrations analysed by Socotec UK:

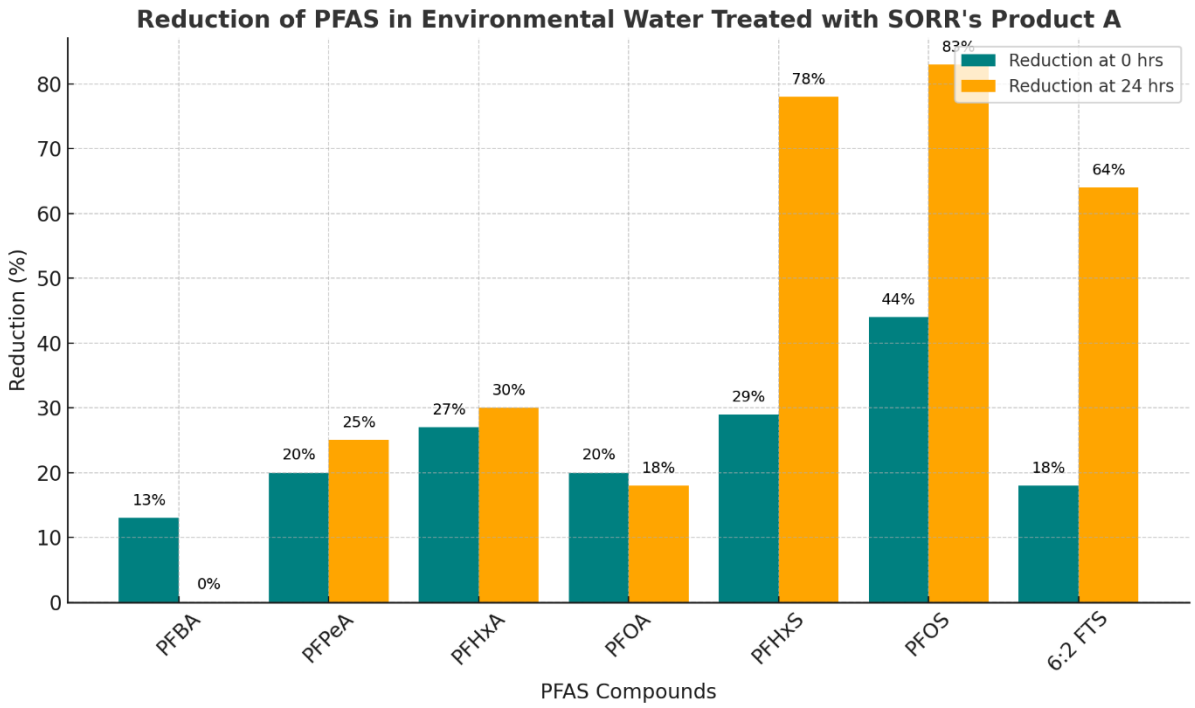

Image of PFAS Graph

The results underscore the sponge's utility as both a diagnostic tool for identifying PFAS contamination gradients and a remediation solution for highly contaminated environments.

3. Offer to Newcastle University: PFAS and Platypus Studies

In light of alarming reports of PFAS bioaccumulation in platypus populations—most notably in *Ourimbah Creek*—SORR made an offer to *Newcastle University* to collaborate on a targeted study. Our proposal included:

1. **Deploying Gyroid Sponge Technology** to map PFAS contamination hotspots in Ourimbah Creek and surrounding catchments, identifying key sources contributing to contamination.
2. **Passive Sampling and Analysis** to determine PFAS concentrations in water and sediment across identified zones, utilising the sponge's high sensitivity to capture low concentrations.
3. **Linking Environmental Data to Wildlife Impact**, particularly focusing on how PFAS contamination correlates with bioaccumulation in platypus populations.

This study would not only provide critical insights into the extent of PFAS contamination but also inform targeted remediation strategies to protect vulnerable species and ecosystems.

4. Gyroid Sponge: A Comprehensive PFAS Solution

Diagnostic Capability

The *Gyroid Sponge* functions as a passive sampling device, enabling the identification and mapping of PFAS contamination gradients in water systems. The LJ19 deployment and positive results from Socotec UK demonstrate its ability to provide robust environmental data for scientific and remediation purposes.

Our approach allows for:

- **High Sensitivity:** Capturing low-level PFAS concentrations over short deployment periods.
- **Contamination Mapping:** Identifying PFAS hotspots and gradients across affected catchments.
- **Evidence-Based Action:** Providing policymakers and stakeholders with accurate contamination data to inform intervention efforts.

Preventative Approach

The *Gyroid Sponge* can be installed in **stormwater systems, industrial discharge points, and drainage networks** to prevent PFAS and associated

pollutants from entering natural waterways. By acting as a preemptive barrier, the sponge captures contaminants at their source, significantly reducing downstream impacts.

Our proposed deployment strategy includes:

- Installation of Gyroid Sponge units in **key inflows and hotspots** identified during PFAS mapping.
- Integration with **smart monitoring systems** to assess PFAS levels before and after filtration.
- Periodic replacement and regeneration using our *Pollutant Adaptive Gradient Extraction (PAGE)* process to ensure sustained performance.

Remediation Solution

The *Gyroid Sponge* is a highly effective remediation tool, capable of **adsorbing and removing PFAS, hydrocarbons, and microplastics** from contaminated environments. Our proprietary *PAGE* process—combining **thermal, chemical, and radiation treatments**—optimises the sponge's adsorption capabilities, making it reusable for multiple cycles.

Key benefits of this process include:

- **High Efficiency:** Up to **98% recovery rate** of captured pollutants during regeneration.
- **Scalability:** Suitable for both **small-scale deployments** (e.g., urban drains) and **large-scale projects** (e.g., industrial wastewater and contaminated lakes).
- **Circular Economy:** Fully recyclable, minimising waste and environmental impact.

5. Application to Current NSW Context

The LJ19 findings on Tuggerah Lake, combined with the Socotec UK results and our proposed collaboration with Newcastle University, highlight the importance of targeted solutions for PFAS contamination. Our technology can address these challenges through:

1. **Mapping PFAS Hotspots:** Deploying sponges to identify contamination sources and dispersion patterns in waterways such as *Ourimbah Creek* and Sutherland Shire's stormwater systems.

2. **Immediate Remediation:** Using PAGE-optimised sponges to efficiently remove PFAS, hydrocarbons, and other pollutants.
3. **Preventative Measures:** Installing the sponge in stormwater networks to prevent PFAS spread from urban and industrial areas.

This approach aligns with both **short-term solutions** (diagnostic and immediate remediation) and **long-term strategies**(preventative measures to protect NSW's ecosystems).

6. Collaborative Opportunities

We are continuing to work with leading scientific organisations to validate the efficacy of the Gyroid Sponge in high-contamination environments. The LJ19 deployment has demonstrated proof-of-concept for scalable solutions in NSW, and our technology has been successfully applied internationally in the UK, Ireland, India, and Saudi Arabia.

We would welcome the opportunity to collaborate with the NSW Government to address PFAS contamination across affected regions. This could include:

- Pilot projects in **key contamination zones** (e.g., Ourimbah Creek, Sutherland Shire waterways).
- State-wide deployment for **PFAS hotspot mapping**.
- Integration of our technology into NSW water management systems.

Conclusion

The *Gyroid Sponge Technology* offers a proven, scalable, and sustainable solution for PFAS contamination—combining diagnostics, prevention, and remediation. Our experience with the LJ19 deployment, validated by *Socotec UK*, combined with our proposed collaboration with Newcastle University, demonstrates the sponge's critical role in addressing contamination challenges and protecting vulnerable ecosystems such as platypus habitats.

I would be grateful if the committee would consider our submission, and I remain available to provide additional data, case studies, or discuss pilot opportunities to further demonstrate the relevance and impact of our technology.

Thank you again for this opportunity, and I look forward to your response.

Kind regards

Rob Manning
General Manager
SORR

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Please consider our environment before printing this email.
Sustainable Oil Recovery & Remediation is proud to be in collaboration with the Central Coast Council, supported by the Federal Government through the Environment Restoration Fund Program. The revolutionary Sucoil® Sponge is a product of Sustainable Oil Recovery & Remediation.